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EXAMINER
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LEE, SHUN K

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/925,059

Applicant(s)

ZHANG, EVAN Y.W.

Examiner

Shun Lee

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 August 2001 and 17 January 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \*   c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 011702.                      6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 124D (pg. 21, line 23). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are also objected to because:

(a) in Fig. 2, "126" should probably be --128-- and "128" should probably be --126-- (see "beam splitter 126" and "mirror 128" on pg. 14, lines 13-29); and

(b) in Fig. 5A, "FIG. 5A" should probably be --FIG. 5-- (see pg. 8, line 25).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are further objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "viewing device mountable to a headgear such that, when said headgear is worn by an operator, said viewing device is positioned just above the eyes of an operator, and said viewing device may be viewed by said operator by looking upwards towards said viewing device" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

4. The disclosure is objected to because of the following informalities:

- (a) on pg. 2, "LIR" in line 13 should probably be --LWIR--;
- (b) on pg. 13, "μμ" in line 10 should probably be --μm-- (all patent applicants should use the metric (S.I.) units followed by the equivalent English units when describing their inventions in the specifications of patent applications; see MPEP § 608.01);
- (c) on pg. 14, "brined" in line 27 should probably be --formed--; and
- (d) on pg. 21, "electronic output 144" in line 6 should probably be --LWIR output signal 146-- (37 CFR 1.84(p)(4)).

Appropriate correction is required.

5. The use of the trademark Altera (second paragraph on pg. 27) has been noted in this application. It should be capitalized (*i.e.*, ALTERA) wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the specification.

***Claim Objections***

7. Claims 1, 2, 4, 12, 23, and 33 are objected to because of the following informalities:

- (a) in claim 1, "at least a portion of " on line 13 should probably be deleted (see "filtered into a first spectral range" on lines 6-7 in claim 1);
- (b) in claim 1, "at least a portion of " on lines 14-15 should probably be deleted (see "filtered into a second spectral range" on line 10 in claim 1);
- (c) in claim 2, "at least a portion of " on line 3 should probably be deleted (see "filtered into a first spectral range" on lines 6-7 in claim 1);
- (d) in claim 2, "at least a portion of " on line 4 should probably be deleted (see "filtered into a second spectral range" on line 10 in claim 1);
- (e) in claim 4, "at least a portion of " on line 4 should probably be deleted (see "filtered into a first spectral range" on lines 6-7 in claim 1);
- (f) in claim 4, "at least a portion of " on line 7 should probably be deleted (see "filtered into a second spectral range" on line 10 in claim 1);
- (g) in claim 12, " are optically" on line 9 should probably be deleted;
- (h) in claim 23, "aid" on line 2 should probably be --and said--;
- (i) in claim 23, "LWIR" on line 2 should probably be --LWIR sensor--; and
- (j) in claim 33, "use" on line 6 should probably be --user--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 14 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "said sensor assembly" in lines 9-10. There is insufficient antecedent basis for this limitation in the claim.

Claim 24 recites the limitation "said infrared optical device" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1, 4-8, 11-13, 16, 18, 23, 24, 27, 31, 32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Ferguson (US 6,379,009).

The specification (pg. 1) describes the visible (VIS) band as ~0.4  $\mu\text{m}$  to ~0.76  $\mu\text{m}$ , the near infrared (NIR) band as ~0.76  $\mu\text{m}$  to ~1.1  $\mu\text{m}$ , the short wave infrared (SWIR) band as ~1.1  $\mu\text{m}$  to ~3  $\mu\text{m}$ , the medium wave infrared (MWIR) band as ~3  $\mu\text{m}$  to ~7  $\mu\text{m}$ , and the long wave infrared (LWIR) band as ~7  $\mu\text{m}$  to ~18  $\mu\text{m}$ .

In regard to claims **1**, **4**, and **5**, Horn discloses (Fig. 1) an infrared imaging device comprising: a display device (15) and a camera (10, 11), said camera comprising:

- (a) an aperture (*i.e.*, optics 10) arranged to allow radiation to enter said camera (10, 11);
- (b) a first sensor (*e.g.*, SWS; column 2, lines 35-67) having a first output comprising a first electrical output, said first output representing an image of said radiation passing through said aperture (10) filtered into a first spectral range (*e.g.*, 1-2  $\mu\text{m}$  in the NIR band; column 2, lines 35-67); and
- (b) a second sensor (*e.g.*, LWS; column 2, lines 35-67) having a second output comprising a second electrical output, said second output representing an image of said radiation passing through said aperture (10) filtered into a second spectral range (*e.g.*, 8-12  $\mu\text{m}$  in the LWIR band; column 2, lines 35-67);

wherein said display device (15) in communication with said camera (10, 11) and arranged such that said first output, said second output, and a combination of both said first and second outputs may be viewed selectively or jointly (column 1, line 54 to column 2, line 17).

While Horn also discloses (column 1, line 54 to column 2, line 17) that the radiation input of a view scene is collimated onto at least two focal plane arrays, the device of Horn lacks an explicit description of a common objective lens comprising a first concave mirror arranged to reflect radiation entering the aperture, a reflective surface arranged to redirect said radiation reflected off said common objective lens toward a beam splitter having a first waveband filter arranged to pass radiation in said first spectral range to

said first sensor and a second waveband filter arranged to pass radiation in said second spectral range to said second sensor, and first and second objective lenses (e.g., identical optics) between said beam splitter and said first and second sensor respectively, and wherein said camera and said display device are aligned along a common optical axis such that parallax between said first and second sensors, and parallax between said camera and said display device are eliminated. However, optics (such as objective lenses, beam splitters, and waveband filters) for night vision technology are well known in the art. For example, Menke teaches (Fig. 2) a common objective lens comprising a first concave mirror arranged to reflect radiation entering an aperture in order to observe images having different spectral ranges. As another example, Owen teaches (column 1, line 18 to column 3, line 27; column 6, line 60 to column 7, line 10) a common optical axis wherein a beam splitter (32 in Fig. 2) and objective lenses are arranged to receive radiation passed through an aperture defined by a common objective lens (14 in Fig. 2) such that parallax is eliminated. As still another example, Ferguson teaches (column 1, line 34 to column 2, line 64; column 7, lines 10-30) a conjugate path (*i.e.*, a common optical axis) on which beam splitters, waveband filters, display devices (*i.e.*, projector) are arranged to selectively direct images having different spectral ranges so as to overlap and display substantially parallax-free images. Therefore it would be obvious to one of ordinary skill to arrange apertures, beam splitters, waveband filters, and the display device along a common optical axis in the device of Horn, in order to display substantially parallax-free overlapped images.



In regard to claim **6** which is dependent on claim 1, the device of Horn lacks a beam combiner arranged to optically combine said first output comprising a first optical image and second output comprising a second optical image into a third output and an optical viewer arranged to provide said first output, said second output, or said third output. However, optics (such as beam combiners) for night vision technology are well known in the art. For example, Ferguson teaches (column 1, line 34 to column 2, line 64; column 7, lines 10-30) a conjugate path (*i.e.*, a common optical axis) on which beam combiners (*i.e.*, beam splitters) and waveband filters are arranged to selectively direct images having different spectral ranges so as to overlap and display substantially parallax-free images. Therefore it would be obvious to one of ordinary skill to provide a beam combiner in the device of Horn, in order to display substantially parallax-free overlapped images.

In regard to claim **7** which is dependent on claim 6, the device of Horn lacks that said optical viewer is monocular. However, Horn also discloses (Fig. 2) that the invention encompasses a monocular display (*i.e.*, scope subsystem 27). Therefore it would be obvious to one of ordinary skill to provide a monocular optical viewer in the device of Horn, in order to obtain a scope subsystem.

In regard to claim **8** which is dependent on claim 6, the device of Horn lacks that said optical viewer is binocular. However, Horn also discloses (Fig. 2) that the invention encompasses a binocular display (*i.e.*, goggle subsystem 20). Therefore it would be obvious to one of ordinary skill to provide a binocular optical viewer in the device of Horn, in order to obtain a goggle subsystem.

In regard to claim **11** which is dependent on claim 1, the device of Horn lacks that at least one lens arranged between said beam splitter and said first sensor arranged to correct aberrations within said first spectral range, or between said beam splitter and said second sensor arranged to correct aberrations within said second spectral range. However, optics (such as aberration correcting lens) for night vision technology are well known in the art. For example, Owen teaches (column 6, line 60 to column 7, line 10) aberration correcting lenses in order to correct for aberrations. Therefore it would be obvious to one of ordinary skill to provide aberration correcting lenses in the device of Horn, in order to correct for aberrations.

In regard to claims **12** and **13** which are dependent on claim 1, Horn also discloses (column 3, lines 1-10 and 49-51) a first processor arranged to combine together said electronic outputs from said first and second sensors. In addition, Horn in view of Menke, Owen, and Fergason is applied as in claim 6 above.

In regard to claim **16** which is dependent on claim 1, Horn also discloses (column 1, line 54 to column 2, line 17) that said display device is capable of selectively displaying said first output, said second output, or a fused image from said first and second outputs, wherein said fused image comprises at least a portion of said first output with at least a portion of said second output.

In regard to claim **18** which is dependent on claim 16, Horn also discloses (column 1, line 54 to column 2, line 17) that said fused image comprises said first and second outputs combined to form an overlapped image.

In regard to claim **23** which is dependent on claim 1, Horn also discloses (Fig. 1) that said second sensor comprises a LWIR sensor (*i.e.*, 8-12  $\mu\text{m}$  in the LWIR band; column 2, lines 35-67). The device of Horn lacks an explicit description that said first sensor comprises a VIS/NIR sensor. However, Horn also discloses (column 2, lines 10-17) that the invention should distinguish both the 0.6-0.9  $\mu\text{m}$  and 1.0-2.0  $\mu\text{m}$  wavelengths. Therefore it would be obvious to one of ordinary skill to provide a VIS/NIR sensor as the first sensor in the device of Horn, in order to distinguish both the 0.6-0.9  $\mu\text{m}$  and 1.0-2.0  $\mu\text{m}$  wavelengths.

In regard to claim **24** which is dependent on claim 1 in so far as understood, the device of Horn lacks that said camera is substantially inaudible. However, Horn also discloses (Fig. 1) that the invention provides a system suitable for military applications. An audible camera would be unsuitable for military applications since any sound generated by the device could lead to detection by an opposing force. Therefore it would be obvious to one of ordinary skill to provide a substantially inaudible camera in the device of Horn, in order to obtain a device suitable for military applications.

In regard to claim **27** which is dependent on claim 1, Horn discloses (column 3, lines 58-61) a transmitter arranged to transmit the output of said camera to a remote location.

In regard to claim **31** which is dependent on claim 1, Horn also discloses (column 3, lines 1-10 and 49-51) processing circuitry arranged to implement image processing and automatic target recognition (*i.e.*, ATR).

In regard to claim **32** which is dependent on claim 1, the device of Horn lacks a switch arranged to alternatively display said first and second outputs. However, Horn also discloses (Fig. 1) a control panel (16). Therefore it would be obvious to one of ordinary skill to that the control panel (16) in the device of Horn comprises a switch arranged to alternatively display said first and second outputs, in order to selectively view first and second outputs.

In regard to claim **34**, Horn in view of Menke, Owen, and Fergason is applied as in claims 1, 6, and 23 above.

12. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Fergason (US 6,379,009) as applied to claim 1 above, and further in view of Neil (US 4,632,498).

In regard to claims **2** and **3** which are dependent on claim 1, while Horn discloses (column 2, lines 33-34) that aperture (*i.e.*, optics 10) process input radiation that is collimated onto a sensor subassembly (11), the modified device of Horn lacks an explicit description that that said camera further comprises a common objective lens comprising a composite lens of elements ZnSe-Ge<sub>33</sub>As<sub>12</sub>Se<sub>55</sub>-ZnSe between said aperture and said beam splitter to correct aberrations in said first and second spectral ranges. However, optics (such as aberration correcting lens) for night vision technology are well known in the art. For example, Owen teaches (column 6, line 60 to column 7, line 10) aberration correcting lenses in order to correct for aberrations. As another example, Neil teaches (column 1, lines 56-68; Table V) aberration correcting lenses

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comprising ZnSe and AMTIR-1 (*i.e.*,  $\text{Ge}_{33}\text{As}_{12}\text{Se}_{55}$ ) in order to correct for aberrations. Therefore it would be obvious to one of ordinary skill to provide aberration correcting lenses (*e.g.*, ZnSe- $\text{Ge}_{33}\text{As}_{12}\text{Se}_{55}$ -ZnSe) in the modified device of Horn, in order to correct for aberrations in the first and second spectral ranges.

13. Claims 9, 10, 17, 19, 20, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Fergason (US 6,379,009) as applied to claims 1, 6, and 16 above, and further in view of Hanson *et al.* (US 5,497,266).

In regard to claims **9** and **10** which are dependent on claim 6, while Horn also discloses (column 3, lines 47-49) that the goggle subsystem is helmet mounted, the modified device of Horn lacks an explicit description that said optical viewer aligns with the eye of an operator and repositionable away from the eye of said operator. However, helmet mounted goggles are well known in the art. For example, Hanson *et al.* teach (column 2, lines 5-18) that said optical viewer (*i.e.*, video display) aligns with the eye of an operator and repositionable away from the eye of said operator. Therefore it would be obvious to one of ordinary skill to provide a repositionable goggle subsystem in the modified device of Horn, in order to stow the goggles out of the operator's line of sight when the goggles when not in use.

In regard to claim **17** which is dependent on claim 16, the modified device of Horn lacks that said fused image comprises a picture in picture or side-by-side configuration. However, helmet mounted displays are well known in the art. For example, Hanson *et al.* teach (Fig. 9) a different display (video display 88 and night

vision equipment 100) for each eye of an operator in order to provide different view for each eye (column 7, line 52 to column 8, line 26). Therefore it would be obvious to one of ordinary skill to display a fused image in a side-by-side configuration in the modified device of Horn, in order for each eye to see a different view.

In regard to claim **19** which is dependent on claim 1, the modified device of Horn lacks that said display device is capable of selectively displaying said first and second outputs independently such that said first output is viewed on one portion of said viewing device, and said second output is displayed on a second portion of said viewing device. However, helmet mounted displays are well known in the art. For example, Hanson *et al.* teach (Fig. 9) a different display (video display 88 and night vision equipment 100) for each eye of an operator in order to provide different view for each eye (column 7, line 52 to column 8, line 26). Therefore it would be obvious to one of ordinary skill to display first and second outputs in a side-by-side configuration in the modified device of Horn, in order for each eye to see a different view.

In regard to claim **20** which is dependent on claim 1, the modified device of Horn lacks that said first output is viewable in a first eye on an operator, and said second output is viewable in a second eye of said operator. However, helmet mounted displays are well known in the art. For example, Hanson *et al.* teach (Fig. 9) a different display (video display 88 and night vision equipment 100) for each eye of an operator in order to provide a different view for each eye (column 7, line 52 to column 8, line 26). Therefore it would be obvious to one of ordinary skill to provide a different display for

each eye of an operator in the modified device of Horn, in order for each eye to see a different view.

In regard to claim **33** which is dependent on claim 1, the modified device of Horn lacks that said first and second outputs are arranged such that when a user opens the left eye while holding the right eye closed, the first output may be seen, when said user opens the right eye while holding the left eye closed, the second output may be seen, and when both the left and right eyes are open, said user may see both said first and second outputs overlapped. However, helmet mounted displays are well known in the art. For example, Hanson *et al.* teach (Fig. 9) a different display (video display 88 and night vision equipment 100) for each eye of a user in order to provide a different view for each eye (column 7, line 52 to column 8, line 26). It should be noted that it is inherent that an eye can only see when the eye is open. Therefore it would be obvious to one of ordinary skill to provide a different display for each eye of an operator in the modified device of Horn, in order for each eye to see a different view.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Ferguson (US 6,379,009) as applied to claim 1 above, and further in view of Baril *et al.* (US 5,683,831) and Gross *et al.* (US 6,075,661).

In regard to claim **14** which is dependent on claim 1 in so far as understood, the modified device of Horn lacks an explicit description of an interconnect assembly comprising: a first connector arranged to releasably secure to a headgear said infrared imaging device; a second connector arranged to releasably secure to said headgear a

power assembly arranged serving as a balancing weight; and at least one interconnecting cable coupling said power assembly to said infrared imaging device. However, helmet mounted goggles are well known in the art. For example, Baril *et al.* teach (column 1, lines 11-51; Fig. 1) an infrared imaging device (16) secured to the front of headgear (14) and coupled by at least one interconnecting cable (24) to a power assembly (18) secured to the back of headgear (14). As another example, Gross *et al.* teach (column 2, line 55 to column 3, line 28; Fig. 1) an infrared imaging device (16) releasably secured to the front of headgear (26) and coupled by at least one interconnecting cable (14) to a power assembly (12) releasably secured to the back of headgear (26). Since the infrared imaging device and power assembly are symmetrically located about the headgear, they serve as balancing weights to each other. Therefore it would be obvious to one of ordinary skill to provide a known interconnect assembly in the modified device of Horn, in order to releasably secure the infrared imaging device and the interconnected power assembly.

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Ferguson (US 6,379,009) as applied to claims 1, 6, and 16 above, and further in view of Ansley *et al.* (US 5,726,671).

In regard to claim **15** which is dependent on claim 1, the modified device of Horn lacks that said display device comprises a viewing device mountable to a headgear such that, when said headgear is worn by an operator, said viewing device is positioned just above the eyes of an operator, and said viewing device may be viewed by said



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operator by looking upwards towards said viewing device. However, helmet mounted displays are well known in the art. For example, Ansley *et al.* teach (column 4, lines 21-27; Fig. 4) a viewing device positioned just above the eyes of an operator in order to provide a high resolution display (column 1, lines 11-22). Therefore it would be obvious to one of ordinary skill to provide a viewing device is positioned just above the eyes of an operator in the modified device of Horn, in order to obtain a high resolution display.

16. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Fergason (US 6,379,009) as applied to claim 1 above, and further in view of Grinberg *et al.* (US 5,389,788).

In regard to claims **21** and **22** which are dependent on claim 1, the modified device of Horn lacks that said camera further comprises an optical window constructed of materials selected from the group consisting of hot pressed ZnS, Ge, Si, and ZnSe over said aperture. However, night vision goggles are well known in the art. For example, Grinberg *et al.* teach (column 4, lines 23-28) a protective window formed from an IR-transparent material such as silicon or germanium. Therefore it would be obvious to one of ordinary skill to provide a Ge optical window in the modified device of Horn, in order to protect the device.

17. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Fergason (US 6,379,009) as applied to claim 1 above, and further in view of Gross *et al.* (US 6,075,661).

In regard to claim **25** which is dependent on claim 1, Horn also discloses (column 3, lines 39-41) two viewing windows (*i.e.*, eyepieces). The modified device of Horn lacks an explicit description that each of said viewing windows arranged such that the distance between said two viewing windows is adjustable. However, helmet mounted goggles are well known in the art. For example, Gross *et al.* teach (column 2, line 55 to column 3, line 28; Fig. 1) an interpupillary adjustment (22). Therefore it would be obvious to one of ordinary skill to provide an interpupillary adjustment in the modified device of Horn, in order to adjust the distance between the two viewing windows.

18. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), Fergason (US 6,379,009), and Gross *et al.* (US 6,075,661) as applied to claim 25 above, and further in view of Hanson *et al.* (US 5,497,266).

In regard to claim **26** which is dependent on claim 25, the modified device of Horn lacks that further comprising a magnification lens arranged in the front of each viewing window to enlarge an image thereon. However, night vision goggles are well known in the art. For example, Hanson *et al.* teach (column 4, lines 51-62) a lens arrangement providing magnification adjustments for an optical viewer. Therefore it would be obvious to one of ordinary skill to provide a magnification lens in the modified device of Horn, in order to enlarge an image for viewing.

19. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Fergason

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(US 6,379,009) as applied to claim 1 above, and further in view of Nettleton *et al.*

(US 5,336,899).

In regard to claim **28** which is dependent on claim 1, the modified device of Horn lacks that further comprising a laser illuminator mounted to said camera for NIR illumination. However, night vision goggles are well known in the art. For example, Nettleton *et al.* teach (column 1, lines 12-40; column 2, line 64 to column 3, line 2) a laser illuminator for NIR illumination to enhance viewing with night vision goggles. Therefore it would be obvious to one of ordinary skill to provide a NIR laser illuminator in the modified device of Horn, in order to enhance night vision viewing.

20. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Ferguson (US 6,379,009) as applied to claim 1 above, and further in view of Jungkman *et al.* (US 4,488,414).

In regard to claim **29** which is dependent on claim 1, the modified device of Horn lacks a waterproof and fireproof envelope sealing said camera and said display device; and at least one foam cut inserted between said envelope and said camera, said at least one foam cut arranged to protect said infrared imaging device against vibration, impact, and hot/cold weather. However, foam envelopes for night vision devices are well known in the art. For example, Jungkman *et al.* teach (column 1, lines 12-40; column 2, line 47 to column 3, line 48) foam envelopes for night vision devices (e.g., infrared binoculars). Therefore it would be obvious to one of ordinary skill to provide a waterproof and fireproof envelope at least one foam cut in the modified device of Horn,

in order to obtain a portable night vision device that can withstand high shock environments.

21. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), and Ferguson (US 6,379,009) as applied to claim 1 above, and further in view of Mammone (US 4,949,378).

In regard to claim **30** which is dependent on claim 1, while Horn also discloses (Fig. 1) a control panel (16), the modified device of Horn lacks a voice activated switch arranged to selectively control said infrared imaging device. However, voice activated switches are well known in the art. For example, Mammone teaches (column 4, lines 60-64) that voice activated switches are obvious equivalents for manual switches. Therefore it would be obvious to one of ordinary skill to provide a voice activated switch in the modified device of Horn, in order to selectively control said infrared imaging device.

22. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horn (US 6,335,526) in view of Menke (US 3,379,830), Owen (US 5,497,266), Ferguson (US 6,379,009), Hanson *et al.* (US 5,497,266), and Ansley *et al.* (US 5,726,671).

In regard to claim **35**, Horn in view of Menke, Owen, and Ferguson is applied as in claims 1, 6, and 23 above. Hanson *et al.* is applied as in claims 9 and 10 above. Ansley *et al.* is applied as in claim 15 above.

**Conclusion**

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
CONSTANTINE HANNAHER  
PRIMARY EXAMINER  
GROUP ART UNIT 2878

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November 26, 2003